

WHAT IS CLAIMED IS:

1. A pharmaceutical composition for intranasal administration to a mammal;
comprising: an effective amount of an opioid; a liquid nasal carrier for the
opioid; and one or more sweeteners, flavoring agents, or masking agents or
combinations thereof.
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2. A pharmaceutical composition according to claim 1, wherein the opioid is
morphine, apomorphine, hydromorphone, oxymorphone, dihydromorphine,
levorphanol, levallorphan, levophenacymorphan, norlevorphanol, nalorphine,
10 nalbuphine, buprenorphine, butorphanol, naloxone, naltrexone, nalmexone,
oxilorphan, cyclorphan, ketobemidone, fentanyl, sufentanil, alfentanil, or
combinations thereof.
3. A pharmaceutical composition according to claim 2, wherein the opioid is
hydromorphone.
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4. A pharmaceutical composition according to claim 2, wherein the opioid is
butorphanol.
- 20 5. A pharmaceutical composition according to claim 1, wherein the volume of
the composition is about 0.1 ml.
6. A pharmaceutical composition according to claim 1, wherein the composition
is preservative free.
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7. A pharmaceutical composition according to claim 1, wherein the composition
contains a buffer.

8. A pharmaceutical composition according to claim 1, wherein the composition is a sterile solution or suspension.
- 5 9. A pharmaceutical composition according to claim 1, wherein the one or more sweeteners, flavoring agents or masking agents is saccharin, sodium saccharin, xylitol, mannitol, sorbitol, sucrose, sucralose, maltodextrin, aspartame, acesulfame potassium, dextrose, glycosides, maltose, sweet orange oil, glycerin, wintergreen oil, peppermint oil, peppermint water, peppermint spirit, menthol, or combinations thereof.
- 10 10. A pharmaceutical composition according to claim 1, wherein the composition has a pH of about 5.0.
- 15 11. A pharmaceutical composition having improved bioavailability for intranasal administration to a mammal; comprising: an effective amount of butorphanol; a preservative-free liquid nasal carrier.
- 20 12. A pharmaceutical composition according to claim 11, wherein the preservative-free liquid nasal carrier comprises anhydrous citric acid, purified water and has a pH of about 5.0, wherein the pharmaceutical composition is free from the preservative benzethonium.
- 25 13. A pharmaceutical composition according to claim 11, wherein the composition is a sterile solution or suspension.
- 30 14. A pharmaceutical composition according to claim 11, further comprising at least one sweetener, flavoring agent or masking agent.
15. A pharmaceutical composition according to claim 14, wherein the sweetener, flavoring agent or masking agent is saccharin, sodium saccharin, xylitol,

mannitol, sorbitol, sucrose, sucralose, maltodextrin, aspartame, acesulfame potassium, dextrose, glycosides, maltose, sweet orange oil, glycerin, wintergreen oil, peppermint oil, peppermint water, peppermint spirit, menthol, or combinations thereof.

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16. A pharmaceutical composition according to claim 11, wherein the composition has a pH of about 5.0.

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17. A pharmaceutical composition having improved bioavailability for intranasal administration to a mammal; comprising: an effective amount of hydromorphone; a liquid nasal carrier having the essential absence of a preservative and the composition containing at least one sweetener, flavoring agent or masking agent.

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18. A pharmaceutical composition for intranasal administration to a mammal; comprising: an effective amount of hydromorphone; a preservative-free liquid nasal carrier comprising sodium chloride, citric acid, water and at least one sweetener, flavoring agent or masking agent.

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19. A pharmaceutical composition according to claim 18, wherein the composition is a sterile solution or suspension.

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20. A pharmaceutical composition according to claim 17, wherein the at least one sweetener, flavoring agent or masking agent is saccharin, sodium saccharin, xylitol, mannitol, sorbitol, sucrose, sucralose, maltodextrin, aspartame, acesulfame potassium, dextrose, glycosides, maltose, sweet orange oil, glycerin, wintergreen oil, peppermint oil, peppermint water, peppermint spirit, menthol, or combinations thereof.

21. A pharmaceutical composition according to claim 18, wherein the composition has a pH of about 5.0.
- 5 22. A pharmaceutical composition according to claim 12, wherein the composition achieves a plasma butorphanol concentration of at least 4000 and 5000 pg/ml.
- 10 23. A pharmaceutical composition according to claim 18, wherein the composition achieves a plasma hydromorphone concentration of at least 4000 and 5000 pg/ml.
- 15 24. A method of treating a mammal suffering from pain comprising intranasally administering to the mammal an effective amount of butorphanol or hydromorphone; a preservative-free liquid nasal carrier comprising sodium chloride, citric acid, water and at least one sweetener, flavoring agent or masking agent.
- 20 25. A method according to claim 24, wherein the at least one sweetener, flavoring agent or masking agent is saccharin, sodium saccharin, xylitol, mannitol, sorbitol, sucrose, aspartame, acesulfame potassium, dextrose, glycosides, maltose, sweet orange oil, glycerin, wintergreen oil, peppermint oil, peppermint water, peppermint spirit, menthol, or combinations thereof.
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